INTRODUCTION

With current release of the ADOT CADD STANDARDS, further steps have been taken to increase uniformity in design concept presentation and to streamline the task of design file creation. Since the whole standard book as well as several items in the cell libraries have been redefined, the current edition invalidates all standard data (book, cell libraries) released or printed prior to MAY-15-1990.

New set of standards consists of five volumes:

- SPECIFICATIONS general specifications, master index
- GRAPHICS VOL. 1 general graphic symbols, mapping, index
- GRAPHICS VOL. 2 rights of way, highway plans, index
- GRAPHICS VOL. 3 structures section symbols, index
- GRAPHICS VOL. 4 traffic operations, traffic studies, index

Internal organization of every volume follows the same pattern: volume contents (general), volume or section specific specifications, list of graphic items (sequential order), graphic items definitions, index. In multi-section volumes such as vol. 2 and vol. 4, features 2, 3 and 4 re-occur in each section listed.

The logical grouping of the graphic items varies from volume to volume; graph. vol. 1 items are grouped by level and by type within each level, the other volumes' graphic items are grouped by type and by level if applicable.

All volumes should be considered as the integral parts of one entity and should never be used separately as standalone, self-sufficient documents. All graphic and non-graphic items defined in the section specific volumes supersede on item by item basis all corresponding items from GRAPHICS VOL. 1 and SPECIFICATIONS volume in case when project is done in or for specific ADOT section. If the desired item or specification is not defined in the applicable section specific volume corresponding item from GRAPHICS VOL. 1 or SPECIFICATIONS volume should be used. Consultants under contract with ADOT should check with specific section for project special requirements and up to date specifications before the project work begins.

The master index contains alphabetically sorted references to all graphic items defined in any of the volumes and each item has up to four entries with first word of the item description different for each entry. In addition to master index, each volume has its own volume index for faster and more efficient searches. First digit of the page number refers to the volume number (0-MMM.mm SPECIFICATIONS, 1-MMM.mm GRAPHICS VOL. 1 etc...), LIBRARY - parent cell library name for given item, CELL - cell name (none in not a cell item).

Several cell libraries support the graphics defined in the STANDARDS and these libraries are distributed by ADOT CADD SYSTEM SERVICES according to the cadd data acceptance and release rules stated in SPECIFICATIONS volume. CADD STANDARDS books and updates are distributed by ADOT ENGINEERING RECORDS either over the counter or through the mailing lists of registered users.

CADD DATA ACCEPTANCE AND RELEASE RULES

All CADD data submitted to or released from ADOT shall be in full compliance with following specifications:

FORMAT

The data shall be in standard InterGraph format, free of corrupted elements, with InterGraph type 9 headers .dgn files) or type 5 headers (.cel files) and valid end of file markers. ADOT will not accept or release data in any other format, e.g. SIF, IGES, DXF, et cetera... If the data is created on a system other than InterGraph, it shall be the responsibility of the submitter to translate data to InterGraph IGDS format.

FILE PARAMETERS

Working units and global origin shall conform to the specifications defined in the ADOT CADD STANDARDS (General or sections specifications) unless explicitly requested otherwise by ADOT.

GRAPHICS

Graphic parameters such as level, color, weight, line code, text size, font, et cetera... shall conform to the specifications defined in the ADOT CADD STANDARDS. Unless explicitly requested otherwise by ADOT the standard InterGraph line styles (line codes) shall not be modified in any other way than patterning (cells placed end to end along a line). All necessary cells and fonts are provided by ADOT in cell and font libraries to insure full conformity with ADOT CADD STANDARDS.

Unless explicitly requested otherwise by ADOT all graphic files shall be self-contained (file must stand on its own) All relevant graphics from external [reference] files must be copied into master design file and then reference files must be detached. Reference file attachment shall be performed using upper case characters on a command line. File extension and logical name shall be present in the reference file specification.

The design file shall contain no more then one plan sheet or map per file.

The file name and date the sheet was plotted shall appear in the lower left corner of the plan sheet (refer to the TIME cell or plan sheet cells for location and graphic definitions).

DISTRIBUTION

The basic means for CADD data transportation shall be standard 1/2", 9 track reel to reel computer tape with density of 1600 [800,6250] BPI (bytes per inch). Data shall be placed on tape using VAX/VMS BACKUP command.

Optionally the 1.2-Mb high density 5.25 inch MS/DOS formatted floppy diskettes can be used but following restrictions shall be applied:

- file must be small enough to fit entirely on one floppy
- data shall be placed on floppy using MS/DOS COPY command
- compression utilities (such as PCTOOLS) or MS/DOS BACKUP command shall not be used
- maximum of 10 floppies of data per project shall be used

Data not complying with the above mentioned restrictions shall be placed on standard magnetic tape only (refer to the tape specification).

The media for the data shall be provided by the requestor.

There will be a 100 US dollar charge for each megabyte of data requested unless the requestor is under contract with ADOT.

No guarantee accompanies ADOT CADD data other than the fact that released data is usable on VAX based InterGraph workstations at ADOT.

GENERAL SPECIFICATIONS

All sections' specific specifications supersede following GENERAL SPECIFICATIONS on item by item basis. Section specific and GENERAL SPECIFICATIONS complement each other and none of them should be considered as self-sufficient separate set of CADD specifications.

FILE PARAMETERS

- file organization: sequential
- file headers: InterGraph type 9 (graphic file)
  InterGraph type 5 (cell library)
- graphic items: all valid InterGraph elements
- InterGraph end of file marker

WORKING UNITS

Working Area	4294967 FT
Subunits/Master Unit	10
Positional Units/Subunit	100

GLOBAL ORIGIN

The global origin shall be set in the precise center of the design plane [cube (3-D)] unless explicitly requested otherwise by ADOT.

Suggested procedure

The best and always precise setup of the global origin in the center of the design plane [cube (3-D)] can be accomplished by setting GOXUOR, GOYUOR [, GOZUOR (3-D)] TCB variables equal to 0 (zero) and writing them into type 9 (design file header).

The following example user command will set up global origin in the precise center of the design plane, regardless of working units setup, if executed while in graphics.

```
;gocen.ucm
;
SET   GOXUOR=0
SET   GOYUOR=0
```

```
      SET   GOZUOR=0    ;if 3D file
      CMD   FILDGN      ;save in type 9 header
      END
```

TEXT

The following general text parameters shall be used on all sheets at scale 1"=100' unless:
- specified otherwise in the sections' specifications
- specified otherwise in the item's standard definition
- preset within a cell
- explicitly requested otherwise by ADOT

For the sheets at different scale TX and LS values shall be modified accordingly to insure text size consistency.

```
FT=23   (proportional, general text)
FT=24   (nonproportional, tabularized text)
TX=15   (existing items)      (0.1500" on full size plots)
TX=17.5 (new items)           (0.1750" on full size plots)
LS=7.5  (existing items)      (0.0750" on full size plots)
LS=8.75 (new items)           (0.0875" on full size plots)
WT=2    (existing items)
WT=4    (new items)
LC=0    (all)
CO=LV   (color shall be numerically equal to the level on
      Which text is placed; for correct values refer to
      ADOT CADD STANDARDS SPECIFICATIONS - LEVELS)
```

The following text sizes for special items such as headers et cetera... shall be used on all sheets unless explicitly requested otherwise by ADOT.

full size	scale 1:100	Leroy
0.26 "	TX=26	290
0.22 "	TX=22	240
0.175"	TX=17.5	200
0.15 "	TX=15	175
0.10 "	TX=10	100

Only fonts (graphic definitions of characters and font numbers) from ADOT font library shall be used. For fonts definitions refer to ADOT CADD STANDARDS - FONTS.

Following fonts constitute the ADOT font library:

```
Font 1      vertical proportional - general text, headers, titles
Font 7      old English       - special headers, titles, non-technical
Font 9      vertical non-proportional - tabularized text, general
Font 23     slanted proportional        - general slanted text
Font 24     slanted nonproportional - tabularized slanted text
Font 30     swiss bold - details, traffic signs, special headers
Font 42     outline proportional            - special graphics
Font 126    symbol font - special symbols (automatic dimens.)
Font 127    fast font         - slashed zero required in text
```

LEVEL [COLOR] DESIGNATIONS

Unless explicitly specified otherwise by ADOT color shall be numerically equal to the level of the graphic item (CO=LV). Displayed colors depend on the color definitions in the color tables and can be defined to suit individual needs.

LEVEL 01
grid ticks, line terminators

LEVEL 02
spot elevations, photo and primary control points

LEVEL 03
section corners, quarter corners, range lines,
Center of section, photogrammetry text

LEVEL 04
monuments, boundaries: city, county, state, park,
forest, reservation

LEVEL 05
exst. index contour lines and text

LEVEL 06
exst. intermediate contour lines

LEVEL 07
exst. vegetation and text

LEVEL 08
mapping symbols: water items and text

LEVEL 09
exst. man-made topography: buildings, noise walls,
billboards, foundations, driveways, sidewalks,
cattle guards, pump houses, etc...

LEVEL 10
text for level 09 items

LEVEL 11
exst. utilities, railroads, standpipes, wells
LEVEL 12
text for level 11 items

LEVEL 13
Exst. minor drainage items: catch basins, manholes,
storm drains, sanitary sewers, ditches, dikes,
Canals, dams, gabions, headwalls, berms, pipes and pipe headwalls, end
Sections, downdrain, spillways, aprons, pipe out-
let's, riprap, bank protection

LEVEL 14
text for level 13 exst. minor drainage items)
text for level 22 exst. major drainage items)

LEVEL 15
exst. easement and permit lines, text

LEVEL 16
exst. edges of roadways, gore paving, grader roads,
turnouts

LEVEL 17
exst traffic items: x-walks, roadway stripping,
signal and light poles, all signs and delineation

LEVEL 18
text for level 17 items

LEVEL 19
road names, text for level 16 items

LEVEL 20
exst. non surveyed roadway centerlines with tick marks

LEVEL 21
exst. non surveyed roadway centerline items: bearings, stationing,
equations, curve data, id for: PC, PI, PT

LEVEL 22
exst. major drainage items: bridges, box culverts,CBC Headwalls
retaining walls, major channels, structural plate
pipes, tunnels

LEVEL 23
Exst. channelization items: curbs, guardrails, impact attenuators,
concrete barriers (median and Half), barricades, chain link cable barriers

LEVEL 24
text for level 23 items

LEVEL 25
north arrow, milepost markers, roadway dimensions,
match lines and other miscellaneous items

LEVEL 26
all miscellaneous surveyed centerlines: survey, office, etc.
miscellaneous centerline items: bearings, stationing,
equations, curve data, id for: PC, PI, PT
location services: all new centerlines and cl items

LEVEL 27
new construction cl with tick marks, cl stationing

LEVEL 28
new construction centerline items: bearings, curve
data, equations, id for: PC, PI, PT

LEVEL 29
exst. fences, right of way markers and lines

LEVEL 30
new fences, right of way markers and lines

LEVEL 31
exst. access control

LEVEL 32
new access control

LEVEL 33
no designation

LEVEL 34
no designation

LEVEL 35
new edges of pavement, turnouts, grader roads, sawcuts

LEVEL 36
text for level 35 items

LEVEL 37
new intermediate and index contour lines, new cut and fill lines

LEVEL 38
new minor drainage items: catch basins, manholes, storm drains, sanitary sewers, ditches, dikes, canals, dams, gabions, headwalls, end sections, berms, downdrains, spillways, pipe outlets, aprons, pipes, riprap, bank protection

LEVEL 39
text for level 38 items (new minor drainage items)
text for level 48 items (new major drainage items)

LEVEL 40
new utilities, railroads, standpipes, wells

LEVEL 41
text for level 40 items

LEVEL 42
new miscellaneous items (hazards): cattle guards, concrete barriers (median and half), impact attenuators, guardrails, barricades, block fences, chain link cable barriers, noise walls

LEVEL 43
text for level 42 items

LEVEL 44
new miscellaneous items (roadway edges), gore paving, curbs, sidewalks, driveway, roadway shoulders

LEVEL 45
text for level 44 items

LEVEL 46
new striping items (pavement marking)

LEVEL 47
text for level 46 items

LEVEL 48
new major drainage items: bridges, box culverts,
tunnels, retaining walls, pump houses, major channels,
structural plate pipes

LEVEL 49
new light poles

LEVEL 50
new pullboxes and conduits, new drainage easement

LEVEL 51
text for level 49 and level 50 items

LEVEL 52
new signals

LEVEL 53
text for level 52 items

LEVEL 54
new signs

LEVEL 55
landscape details

LEVEL 56
text for level 55 items

LEVEL 57
irrigation details

LEVEL 58
text for level 57

LEVEL 59
all area patterning and shading

LEVEL 60
standard grid - profile sheet (1 inch)

LEVEL 61
standard grid - profile sheet (intermediate)

LEVEL 62
plan sheet text nodes

LEVEL 63
plan sheet boarder

Misc:

Filenaming conventions are for everyone and are to be followed on the preparation of ALL ADOT plans.

Plansheets for the various types of plans are provided in the cell libraries provided by ADOT and are to be utilized as they are delivered. Modification of ADOT cells is discouraged. If a cell needs modification then the proper ADOT group must modify the cell and redistribute the library to everyone.

ROADWAY DESIGN FILE NAMING CONVENTIONS

Eight Digits
Ex. h1234p11.dgn
(All lower Case)

Where:'h' refers to highway (or roadway)
'1234' refers to project tracs no.
'p11' refers to three character naming convention (See below)
'dgn' is the file extension

Note: It is recommended that all file names should be eight characters long and in lower case. All 2d Microstation files should have extension of '.dgn' and all 3d files should have extension of '.3d'except Inroads files.

SHEET TYPE	NAMING CONVENTION (Last three characters)
Microstation Plan Sheets	
Border Sheet	bdr
Channel Plan or Profile	c01 - c99
Detail Sheet	dta, dtb etc.
Design Sheet	ds1 - ds9
Detour Sheet	dr1 - dr9
Drainage Sheet	d01 - d99
Face Sheet	fs
Geometry Sheet	g01 - g99
Plan Sheet	p01 - p99
Profile Sheet (Vertical Alignment)	v01 - v99
Ramp Sheet	r01 - r99
Retaining Wall Sheet	w01 - w99
Sanitary Sewer Sheet	ssa, ssb etc.
Sheet 1A	1a
Sheet 1B	1b
Sheet 1C	1c
Sheet 1D	1d
Staking Diagram Sheet	sta, stb etc.
Storm Drain Sheet	sda, sdb etc.
(including Plan and/or Profile)	
Summary Sheets	
Barrier Summary Sheets	sb1 - sb9
Pipe Summary Sheets	sp1 - sp9
Culvert Summary Sheets	sc1 - sc9
Super Elevation Sheet	se1 - se9

SHEET TYPE	NAMING CONVENTION

	(Last three digits)

Microstation Plan Sheets (contd.)

Turn-Out Sheet	**t01 - t99**
Utility Sheet	**u01 - u99**
Water Line Sheet	**wl1 - wl9**

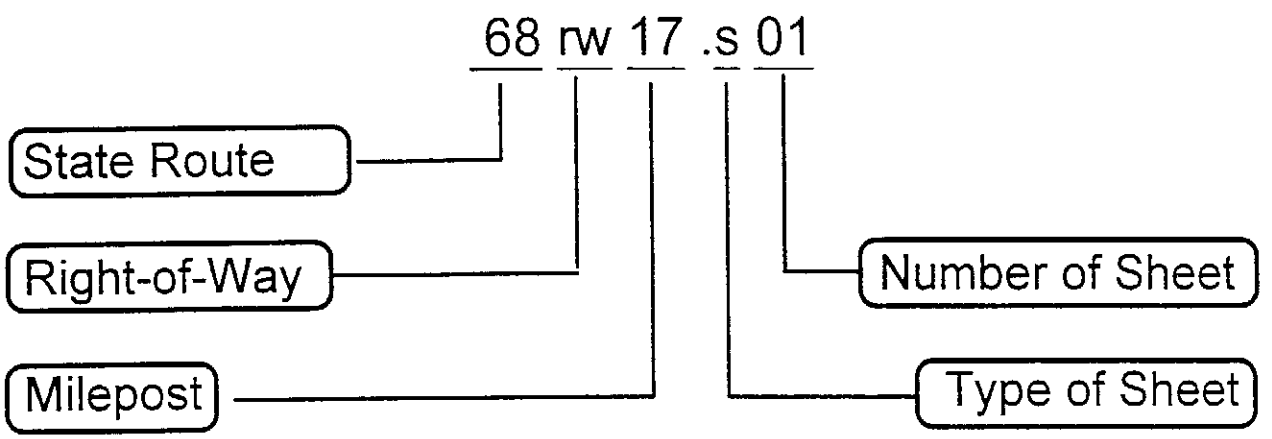
Miscellaneous Files (mentioned in CAD workflow documentation)

Design Base File (Roadway geometry)	**h1234des.dgn**
Master Layout File	**h1234mas.dgn**
Topography File	**h1234tpo.dgn**
Cross Section File	**h1234xs.dgn**

Inroads Files

Project File (ASCII file to store other files info.)	**h1234.rwk**
Geometry Project File (Alignment File)	**h1234.alg**
Surface Files :	
(Note : Three characters can be added to differentiate surface names.)	
New Surface	**h1234new.dtm**
Existing Surface	**h1234ext.dtm**
Template Libraries	**h1234.tml**
Roadway Libraries	**h1234.rwl**

FILE NAMING CONVENTION FOR RIGHT-OF-WAY



TYPE OF SHEET

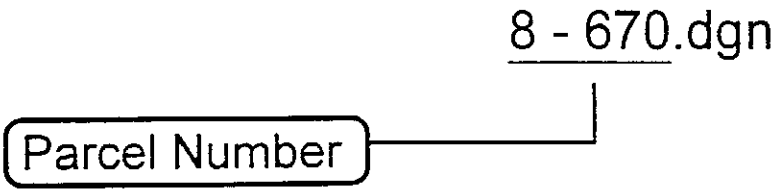
a01 through a99:	Cronaflex Sheets (68rw17.a01)
r01 through r99:	Raster files used to create Cronaflex sheets (single attachment; final to be an Intergraph "*.cot" file [68rw17.r01])
o01 through o99:	Ownership Record Sheets (68rw17.o01)
v01 through v99:	Vicinity Map (68rw17.v01)
s01 through s99:	Plansheet (68rw17.s01)
ndx:	Index to Existing R/W (68rw17.ndx)

BASEMAP FILES

vln:	Line work for vicinity maps (68rw17.vln)
aln:	Centerline related data for plan sheets (68rw17.aln)
dgn:	Section and property lines for plan sheets (68rw17.dgn)
xtp:	Existing topography for plan sheets (68rw17.xtp)
ntp:	New construction features for plan sheets (68rw17.ntp)
bdr:	Border (68rw17.bdr)
res:	Resolution of Establishment (68rw17.res)
pnt:	Point File (68rw17.pnt)

TYPE OF FILES

*.dgn:	MicroStation Graphics File (68rw17.dgn)
*.asc:	Point file in ASCII Format (68rw17.asc)
*.dat:	Point file in ASCII Format (68rw17.dat)
*.rpt:	InRoads/COGOClassic Report Files (68rw17.rpt)
*.alg:	InRoads/COGOClassic Geometry Files (68rw17.alg)



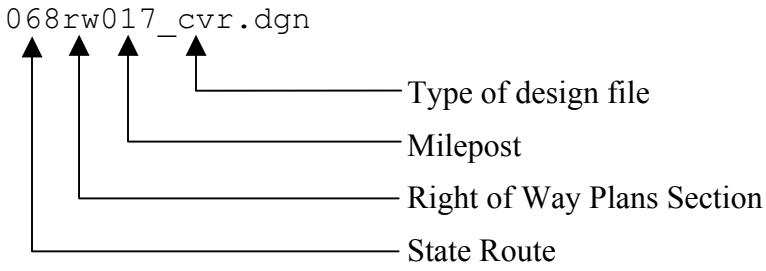
R/W Project CADD File Names

R/W Project 068 MO 017 H2191 01R (State Route 68 at milepost 17) will be used as the example project for the required file names.

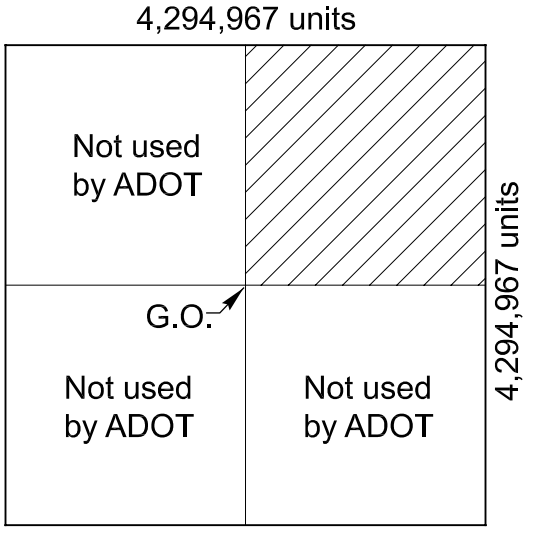
Plan sheet type	Previous file name	New file name
Cover Sheet	068rw017.cover	068rw017_cvr.dgn
Standard Abbreviations	068rw017.standards	068rw017_std.dgn
Ownership Record sheet	068rw017.ownership1	068rw017_ors01.dgn
	068rw017.ownership2	068rw017_ors02.dgn
Vicinity Map	068rw017.vicinity1	068rw017_vm01.dgn
	068rw017.vicinity2	068rw017_vm02.dgn
Plan sheet	068rw017.plan01	068rw017_p01.dgn
	068rw017.plan02	068rw017_p02.dgn
Linework files		
Vicinity Linework	068rw017.vicinitylinework	068rw017_vln.dgn
Plan Linework	068rw017.planlinework	068rw017_pln.dgn
Centerlines	068rw017.alignment	068rw017_aln.dgn
New R/W, TCE, etc.	068rw017.newacq	068rw017_acq.dgn
Plansheet Border	068rw017.border	068rw017_bdr.dgn
Miscellaneous		
Index to Existing R/W (If separate sheet is approved)	068rw017.existingindex	068rw017_idx.dgn
Parcel Exhibit	8-670.parcelexhibit	8-670_exh.dgn
Parcel Insert Sheet	068rw017.plan??	068rw017_par01.dgn
Point ID Sheet	068rw017.pointid01	068rw017_ptid01.dgn
Resolution of Establishment	068rw017.resolution	068rw017_res.dgn
Cogo		
Point file (ASCII)	068rw017.asc	068rw017.asc

Plan sheet type	Previous file name	New file name
Results of Survey, Monumentation Staking Plan & Monumentation Survey		
Survey Linework	068rw017.surveylinework	068rw017_sln.dgn
Plan sheet	068rw017.survey01	068rw017_rs01.dgn
	068rw017.survey02	068rw017_rs02.dgn
	… Etc.	
Monumentation Staking	(Use next available #)	
Plan & Monumentation	068rw017.survey03	068rw017_rs03.dgn
Survey	068rw017.survey04	068rw017_rs04.dgn
	… Etc.	
Note: The Monumentation Staking Plan will be transformed into the Monumentation Survey sheets at the completion of the final survey.		
BIA Application Sheet	068rw017.bia	068rw017_bia.dgn
Construction & topo features		
Existing topography	068rw017.existingtopo	068rw017_topo.dgn
New Construction	068rw017.newconstr	068rw017_cst.dgn
New Drainage	068rw017.newdrainage	068rw017_drn.dgn

File Name Structure



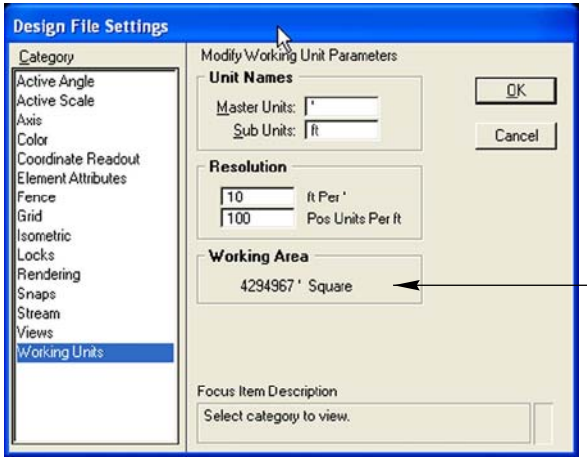
DESIGN PLANE, WORKING UNITS AND GLOBAL ORIGIN
for MicroStation



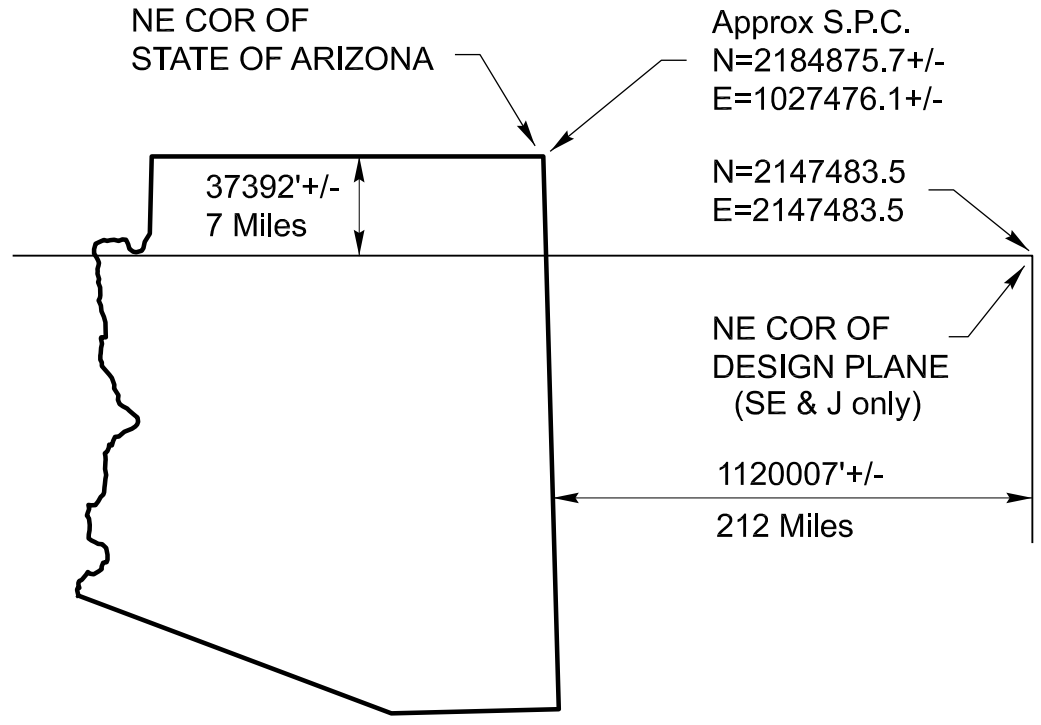
NOTE:
ADOT only uses the NE quad.
of the design plane

GO=2147483.6480,2147483.6480
which is the center of the
design plane.

When using State Plane Coordinates
portions of the State fall outside
of the design plane. (SE & J only)



Working Units

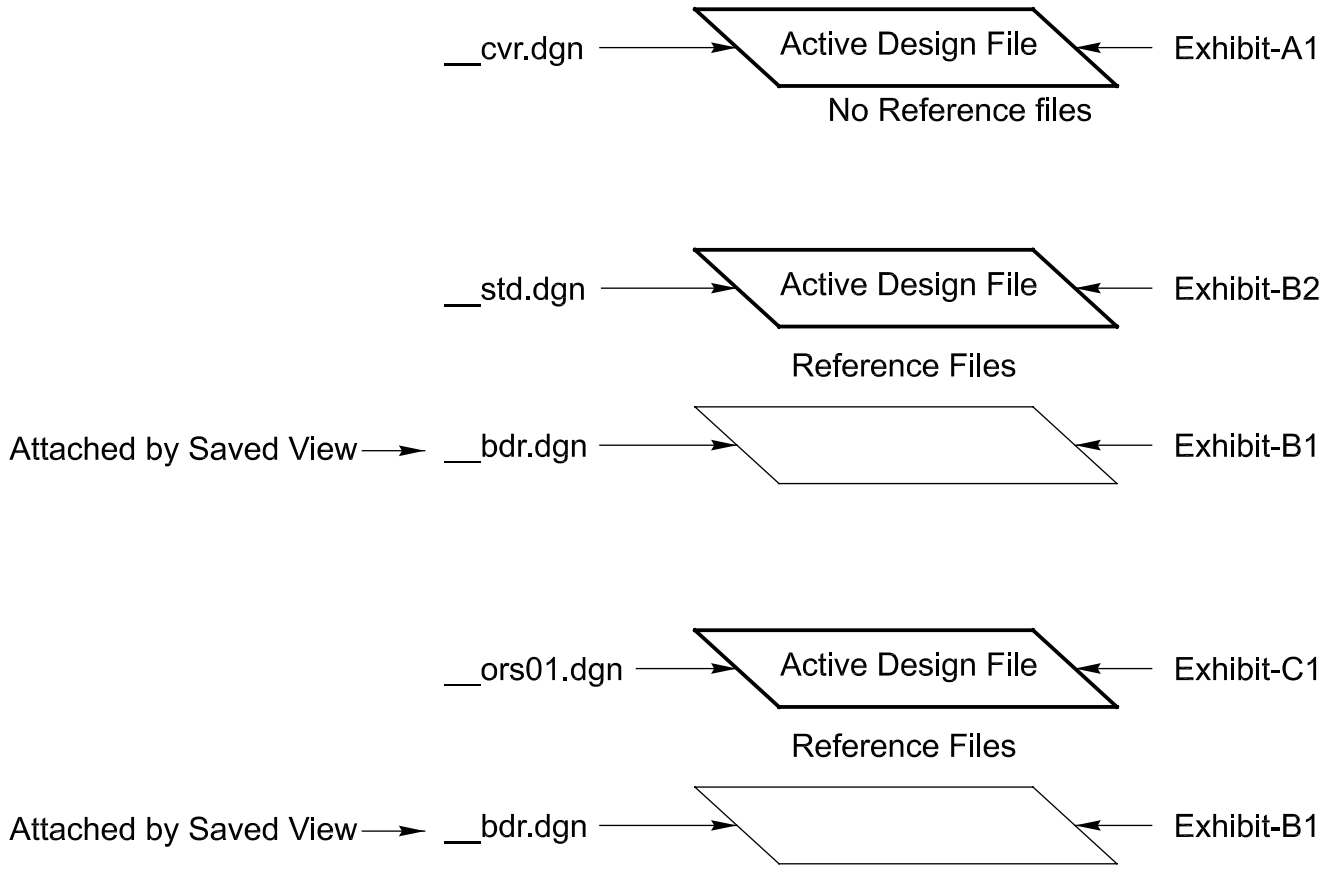


TYPICAL ADOT PROJECT & REFERENCING
for MicroStation

Order of Sheets of a Typical Plan Set

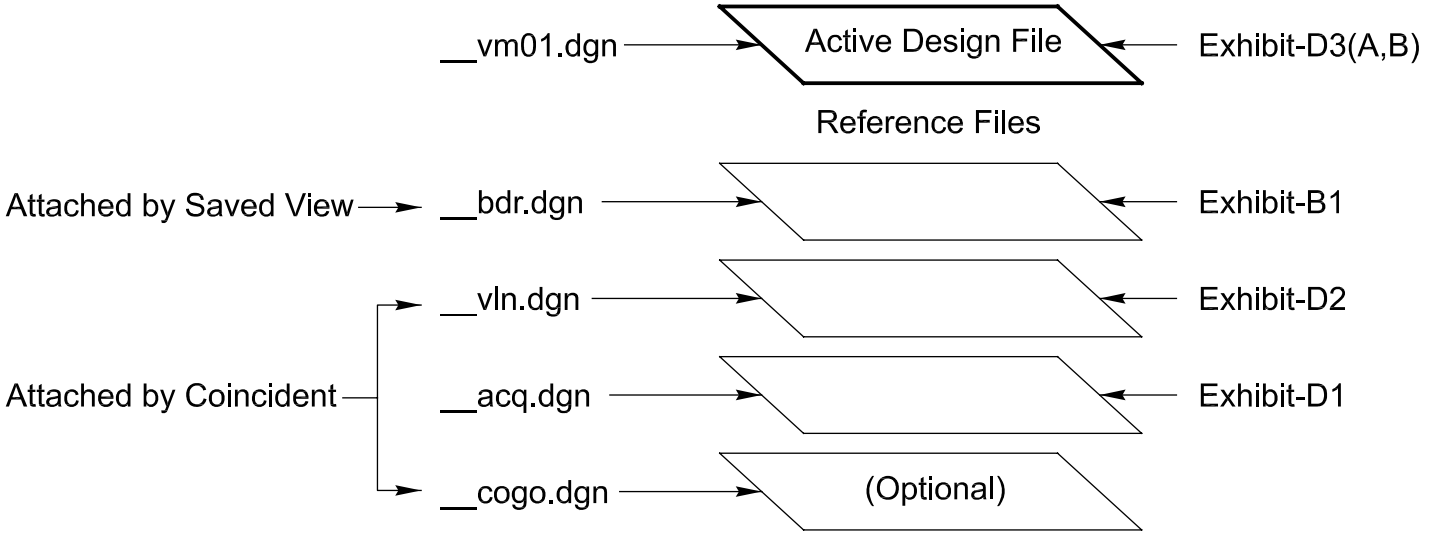
Cover Sheet
Standard Abbreviations & Symbols
Ownership Record Sheet
Vicinity Map Sheet
Index to Existing R/W Sheet
(If not shown on Vicinity Map)
Plan Sheet
Parcel Insert Sheet
(If not shown on Plan Sheet)
Detail Sheet
(If required)
BIA Application Sheet
(If required)
Results of Survey Sheet
(If required)

REFERENCING SCHEME



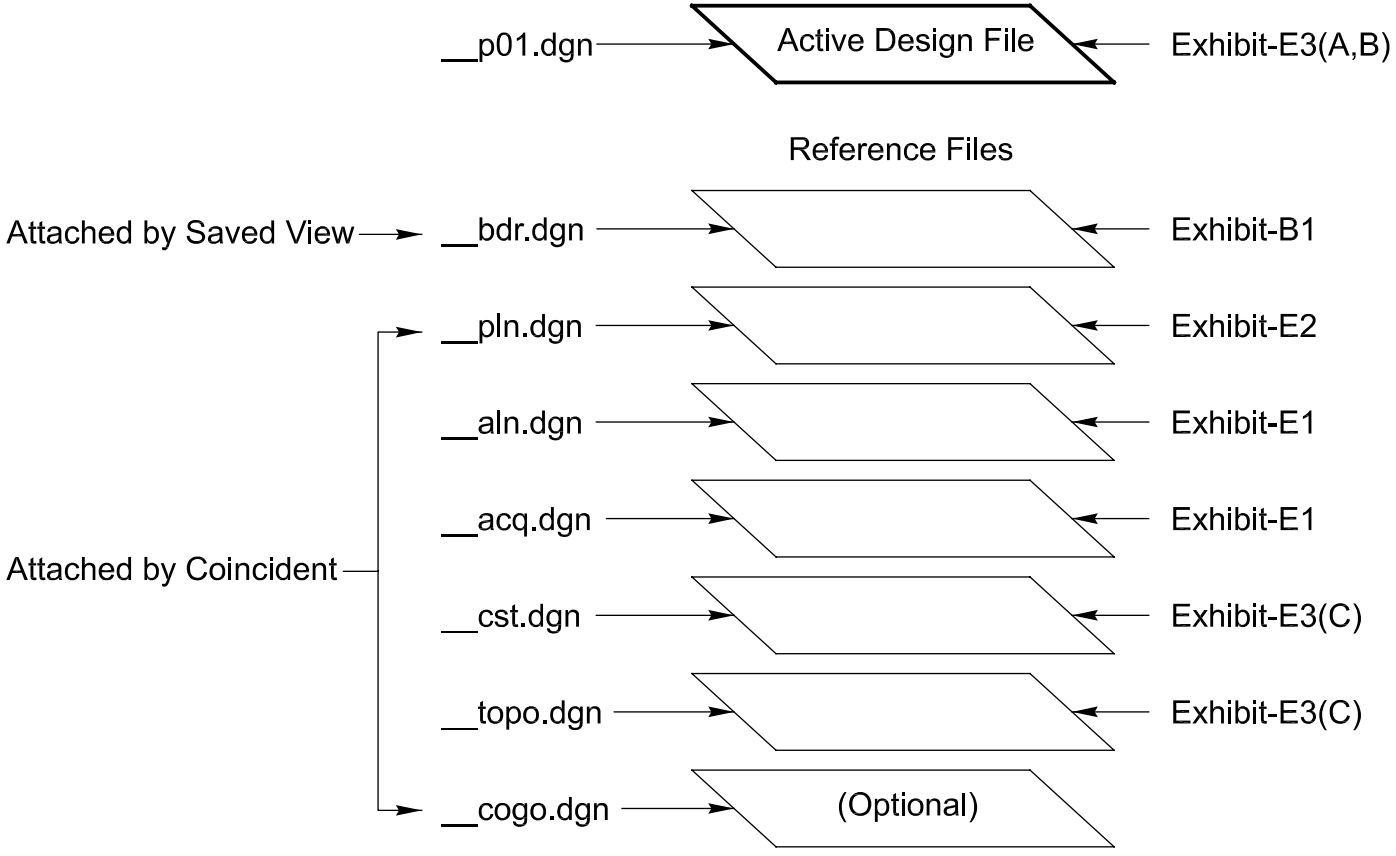
TYPICAL ADOT PROJECT & REFERENCING
for MicroStation

REFERENCING SCHEME



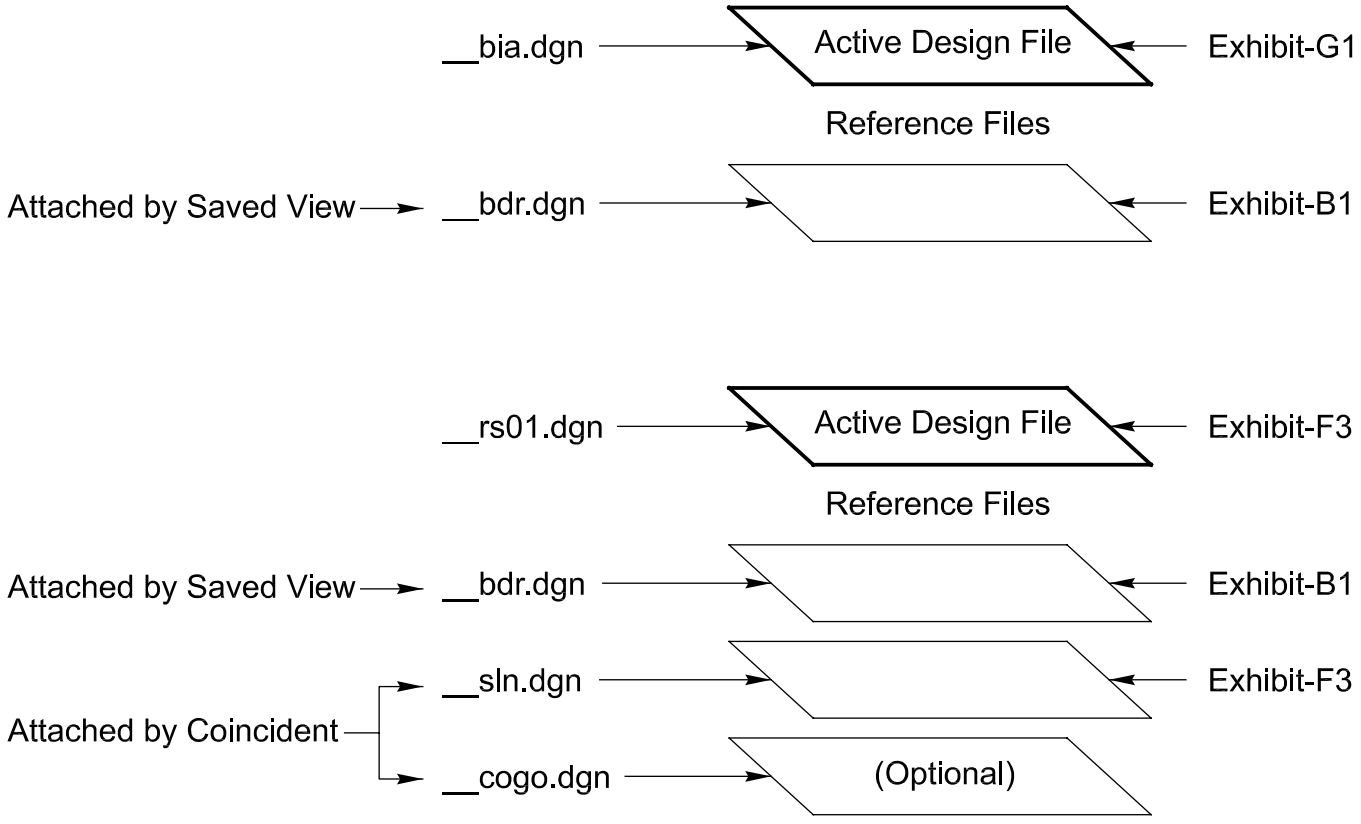
TYPICAL ADOT PROJECT & REFERENCING
for MicroStation

REFERENCING SCHEME



TYPICAL ADOT PROJECT & REFERENCING
for MicroStation

REFERENCING SCHEME



ADOT PROJECT SETUP PROCEDURES
for MicroStation

PROJECT SETUP

Create Project Folder - Use W.O. # or TRACS #
Copy seed_bdr.dgn & seed_cvr.dgn to Project Folder
Rename to ADOT naming scheme (i.e. 085rw138_bdr.dgn)
Create __cogo.dgn design file from Cogo Program

BASE FILES

Open __bdr.dgn design file
Complete Title Block
Create New Design File - __std.dgn
Reference __bdr.dgn then Add RWSTDS cell
Create New Design File - __ors01.dgn
Reference __bdr.dgn then Add CRWORS cell

PLAN FILES

Create New Design File - __pln.dgn
Reference __cogo.dgn then Fit View
Determine Project Limits from Scope
Insert Sheet Outline at scale of Plan sheets
Create New Design file __p01.dgn
Reference __pln.dgn & __cogo.dgn
Rotate View to Sheet Outline
Reference __bdr.dgn

CONSTRUCTION FILES

When available from the Design Consultant obtain the existing topo and new construction features. Edit the line styles per Exhibit-E3(C)
Attach to Plan sheets

ROS FILES

Create New Design File - __sln.dgn
Reference __cogo.dgn
Insert Sheet Outline at ROS scale
Create New Design File - __rs01.dgn
Reference __sln.dgn
Reference __bdr.dgn

VICINITY FILES

When the plan linework is substantially complete make a copy and rename it to __vln.dgn
Adjust linestyle to Vicinity Map scale
Insert Sheet Outline for Vicinity Sheets
Create New Design File - __vm01.dgn
Reference __vln.dgn
Rotate View - Reference __bdr.dgn

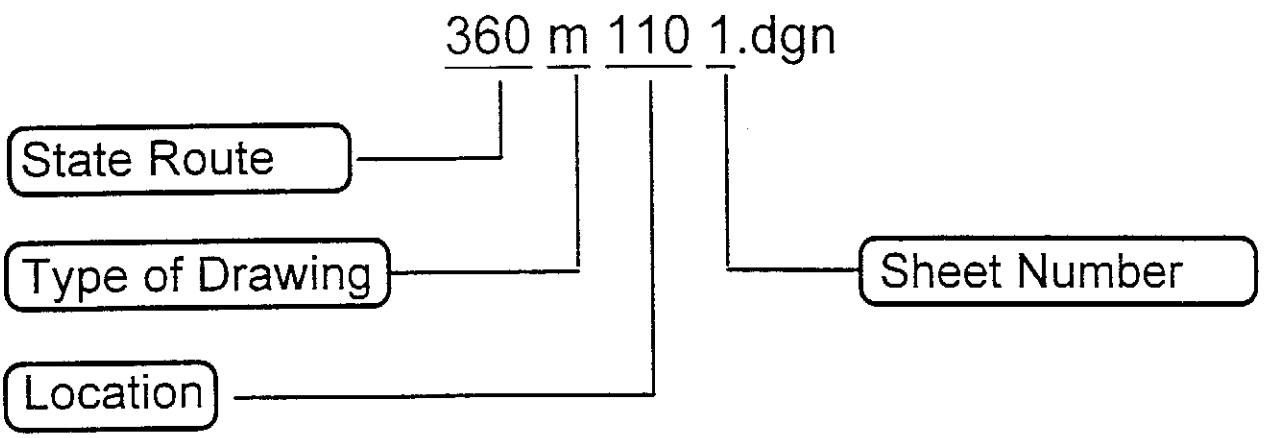
ALIGNMENT FILES

Create New Design File - __aln.dgn
Reference __cogo.dgn
Draw alignment and pattern
Attach to Plan sheets

NEW ACQUISITION FILES

Create New Design File - __acq.dgn
Reference __cogo.dgn
Draw New R/W, TCE etc.
Attach to Plan sheets & Vicinity Map

FILE NAMING CONVENTION FOR TRAFFIC STUDIES



TYPE OF DRAWING

a: Accident Diagram
b: Border
c: Condition Diagram
i: Improvement Diagram
m: Master Drawing
s: Speed Zone Diagram
t: Turning Radius Diagram

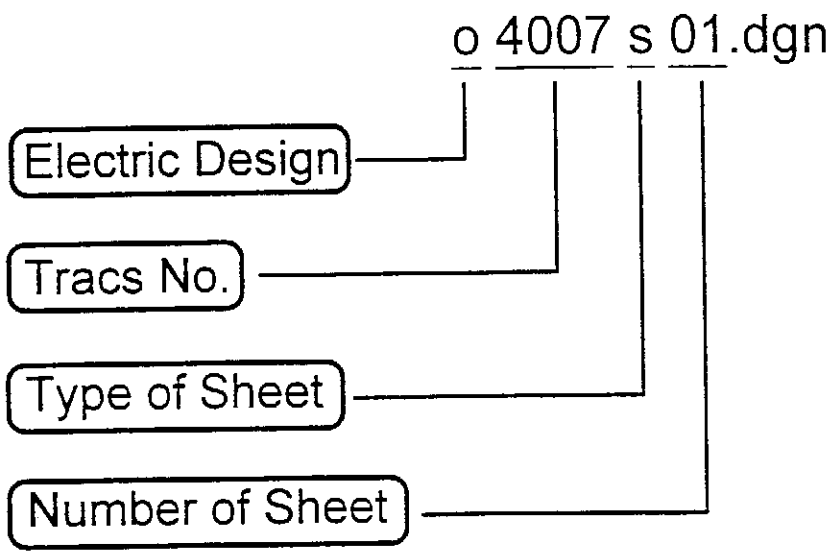
LOCATION

If using milepost, show only the milepost that begins the drawing on that page. If using a cross street then use only the first 3 letters or numbers.

SHEET NUMBER

1 through 9; if additional sheets are required, then use the alpha characters "a" through "z"

FILE NAMING CONVENTION FOR TRAFFIC ELECTRIC DESIGN



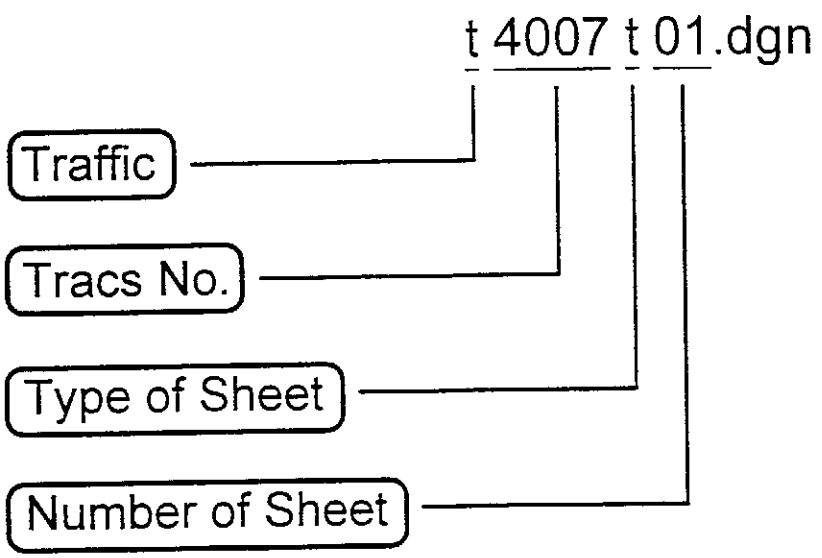
TYPE OF SHEET

s:	Signal Sheet
l:	Lighting Sheet
d:	Detail Sheet
ts:	Standards (USE ONLY FOR STANDARD DRAWINGS) EXAMPLE : Filename = eets33.dgn or mets33.dgn would be for Lighting and Signals Standard ETS 3.3 the first letter e stands for English and the m stands for Metric
ug:	Underground Conduit
ic:	Interconnect
fm:	Freeway Management
lr:	Loop Replacement
sl:	Sign Lighting

BASEMAP FILES

des:	Roadway Design Master (t4007des.dgn) - New Roadway Features
uti:	Utilities (t4007uti.dgn) - New & Existing Gas, Tel etc...
tpo:	Topography (t4007tpo.dgn) - Existing Features
bdr:	Border (t4007bdr.dgn) - Plan Sheet Traffic Design

FILE NAMING CONVENTION FOR TRAFFIC DESIGN



TYPE OF SHEET

t01 through t99:	Traffic Control Sheet
td1 through td9:	Traffic Control Detail Sheet
tn1 through tn9:	Traffic Control Note Sheet
p1 through p99:	Pavement Marking Sheet
pd1 through pd9:	Pavement Marking Detail Sheet
pn1 through pn9:	Pavement Marking Notes Sheet
d01 through d99:	Sign Detail Sheet
l01 through l99:	Sign Locations Sheet
s01 through d99:	Sign Summary Sheet
f01 through f99:	Sign Formats Sheet
r01 through r99:	Crossroad Sheet
2:	For Sheet 2 of Sign Rehab Projects

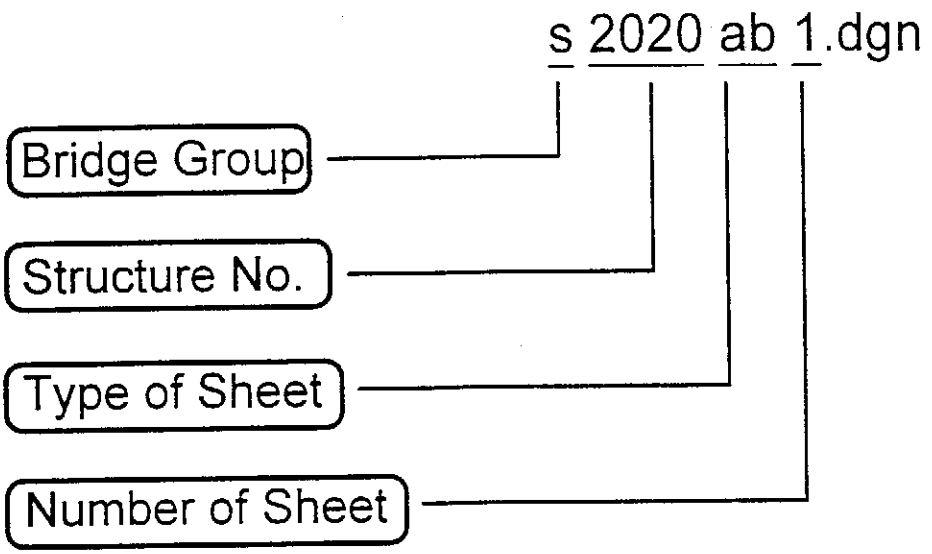
BASEMAP FILES

des:	Roadway Design Master (t4007des.dgn) - New Roadway Features
uti:	Utilities (t4007uti.dgn) - New & Existing Gas, Tel etc...
tpo:	Topography (t4007tpo.dgn) - Existing Features
bdr:	Border (t4007bdr.dgn) - Plan Sheet Traffic Design

TRAFFIC STANDARDS

ts: Standards (USE ONLY FOR STANDARD DRAWINGS)
EXAMPLE : Filename = ts4m202a through ts4m202z.dgn would be for Traffic Standard 4-M-2.02a through 4-M-2.02z

FILE NAMING CONVENTION FOR BRIDGE GROUP



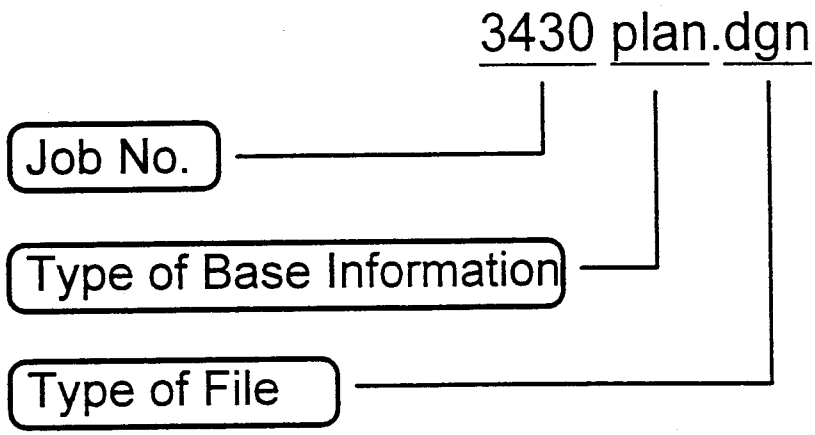
TYPE OF SHEET

ab: Abutment Plan And Elevation Sheet
ad: Abutment Detail Sheet
af: Abutment Diaphragm Detail Sheet
ap: Approach Slab Detail Sheet
bb: Barrier Bump Out Detail Sheet
ba: Barrier Replacement Sheet
bd: Bearing Detail Sheet
bo: Block out Detail Sheet
br: Bridge Removal Sheet
co: Change or Change Order Sheet
cu: Culvert Detail Sheet
dd: Deck Detail Sheet
dp: Deck Plan Sheet
df: Diaphragm Detail Sheet
ds: Drilled Shaft Detail Sheet
et: Elevation Table (Example - Build-up Table) Sheet
ej: Expansion Joint Sheet
fl: Footing Layout Sheet
fd: Foundation Data Drawing Sheet
gp: General Plan Sheet
nq: General Notes and Quantities Sheet
gd: Girder Detail Sheet
gl: Girder Layout Sheet
jr: Joint Repair Sheet
jb: Junction Box Detail Sheet
ld: Light Detail Sheet
lp: Location Plan Sheet
md: Miscellaneous Detail Sheet
pd: Pier Detail Sheet
pf: Pier Diaphragm Sheet
pr: Pier Plan and Elevation Sheet

BRIDGE GROUP TYPE OF SHEET (CONTINUED)

ps: Prestressing Detail Sheet
rd: Rail Detail Sheet
rw: Retaining Wall Detail Sheet
sd: Screed Detail Sheet
ss: Sign Support Sheet
sc: Soil Cement Sheet
sp: Scour Protection Sheet
xs: Typical Cross Section Sheet
ww: Wingwall Detail sheet

FILE NAMING CONVENTION FOR PHOTOGRAMMETRY ENGINEERING SUPPORT SERVICES

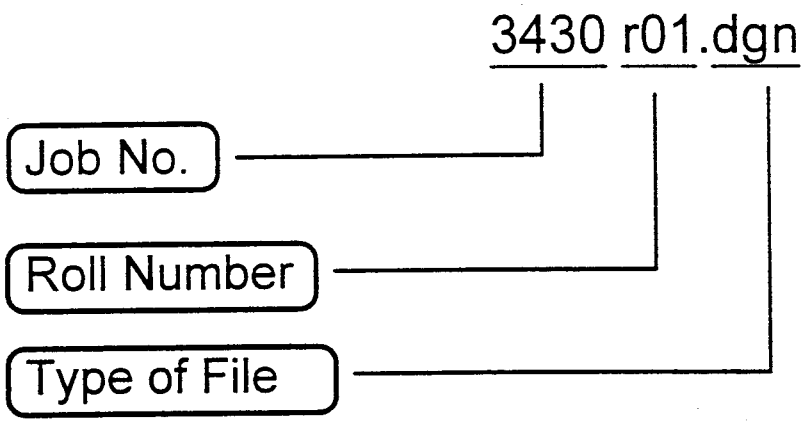


TYPE OF BASE INFORMATION

pipe: Existing Drainage and Pipe Notes
ali: MicroStation Graphics or InRoads Design Geometry for Highway Alignment File
plan: Planimetric Master files
sec: Section Corners, Control Features and Notes
rw: Right-of-Way Points

TYPE OF FILES

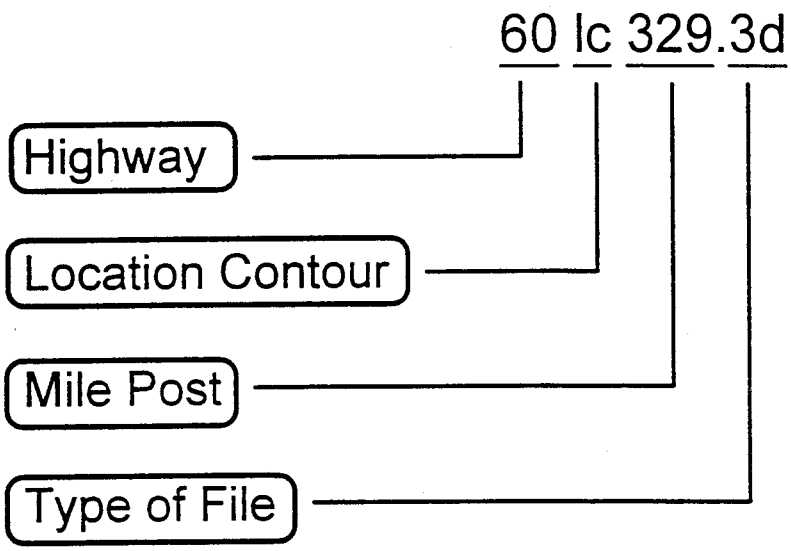
***.dgn:** MicroStation Graphics File (3430ali.dgn)
***.alg:** InRoads Geometry for Highway Alignment File (3430ali.alg)
***.dtm:** InRoads Digital Terrain Model [DTM] File (3430.dtm)
***.3d:** Three Dimensional MicroStation Graphics File (3430.3d)



TYPE OF FILES

***.dgn:** MicroStation Graphics File (3430r01.dgn)
***.dtm:** InRoads Digital Terrain Model [DTM] File (3430r01.dtm)
***.3d:** Three Dimensional MicroStation Graphics File (3430r01.3d)

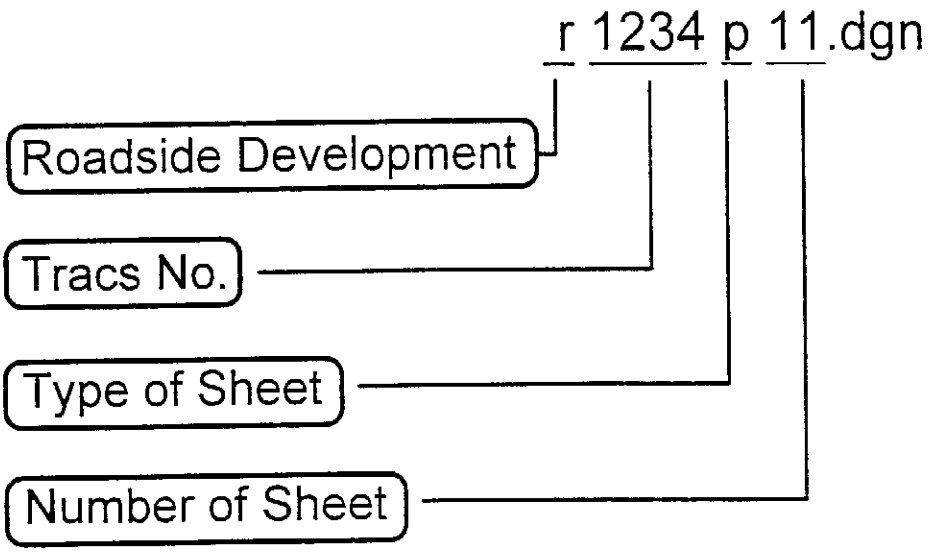
FILE NAMING CONVENTION FOR ENGINEERING SURVEY SECTION



TYPE OF FILES

*.asc: Field Survey Data [X-Y-Z Coordinates and Descriptors] in ASCII format (60.asc)
*.alg: InRoads Geometry for Highway Alignment File (60lc329.alg)
*.dtm: InRoads Digital Terrain Model [DTM] File (60lc329.dtm)
*.3d: Three Dimensional detail location maps with contours [1"=20', 1' contour intervals] (60lc329.3d)

FILE NAMING CONVENTION FOR ROADSIDE DEVELOPMENT



TYPE OF SHEET

p01 through p99:	Planting Plan Sheet
i01 through i99:	Irrigation Plan Sheet
sum:	Plant Summary Sheet
ld1 through ld9:	Landscape Detail Sheet
gd1 through gd9:	Landscape Architectural Graphic Detail Sheet
id1 through id9:	Irrigation Detail Sheet
g01 through g99:	Granite Mulch/Seeding Summary Sheet
ovr:	Project Overview Sheet
ra:	Rest Area Sheet
pi1 through pi9:	Plant Inventory Table Sheet
n01 through n09:	Native Plant Inventory Table Sheet
std:	Standard Sheet

BASEMAP FILES

pl1 through pl3:	Planting Design Master file (r1234pl1.dgn)
ir1 through ir3:	Irrigation Design Master file (r1234ir1.dgn)
grp:	Landscape Architectural Graphics Master File (r1234grp.dgn)
des:	Roadway Design Master (r1234des.dgn)
tpo:	Topography Master (r1234tpo.dgn)
bdr:	Project Sheet/Border (r1234bdr.dgn)
3d1 through 3d9:	Three Dimensional files

GENERAL SPECIFICATIONS

LEROY	WT	LINE WEIGHT DEFINITIONS
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LC	LINE CODE DEFINITIONS
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revision date 01-01-90

FONTS

Contents

FONT 1

VERTICAL PROPORTIONAL
(ADOT FONT LIBRARY)

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revision date 01-01-90

FONT 7

OLD ENGLISH (ADOT FONT LIBRARY)

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NOTICE:

ANY OTHER CHARACTERS USED WILL BE DISPLAYED AND PLOTTED AS FAST FONT

revision date 01-01-90

FONT 9

VERTICAL NONPROPORTIONAL
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FONT 23

SLANTED PROPORTIONAL
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MODIFICATIONS

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revision date 01-01-90

FONT 24

SLANTED NONPROPORTIONAL (ADOT FONT LIBRARY)

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revision date 01-01-90

FONT 30

SWISS BOLD
(ADOT FONT LIBRARY)

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NOTICE:

BIT STREAM FONT - NOT APPLICABLE ON MICROSTATION (PC)

revision date 01-01-90

FONT 42

OUTLINE PROPORTIONAL (ADOT FONT LIBRARY)

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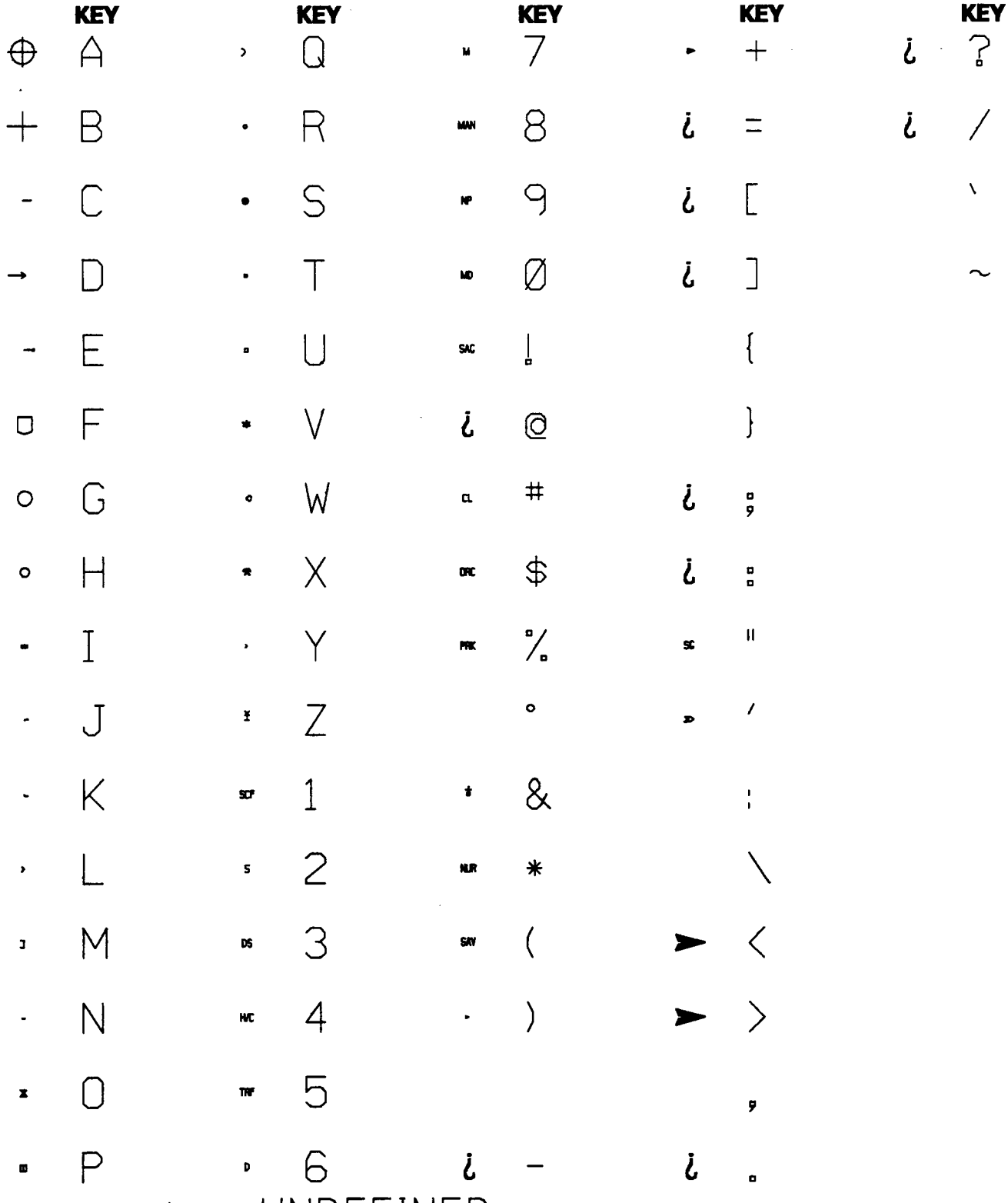
NOTICE:

ANY OTHER CHARACTERS USED WILL BE DISPLAYED AND PLOTTED AS FAST FONT

revision date 01-01-90

FONT 126

SYMBOL FONT (ADOT FONT LIBRARY)



revision date 01-01-90

FONT 127

FAST FONT
(ADOT FONT LIBRARY)

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57/64 59/64 61/64 63/64

NOTICE:

IGDS VER. 8.8.2 FONT 0

revision date 01-01-90

SPECIAL CHARACTERS - ADOT FONT LIBRARY

GRAPHIC DEFINITION	FONT1 KEY	FONT9 KEY	FONT23 KEY	FONT24 KEY
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revision date 01-01-90

Instructions to Access the Roadway FTP Site:
1) Click on the hotlink below provided in blue
2) A logon box will display, the User Name will be roadway, the Password is heat, Select the Login button.
3) This will bring up the FTP (File Transfer Protocol) Site.

The user that places their data on the FTP site must also provide the information below to the consultant so they can download the data.

If there are any question please feel free to contact us.
Thanks,
Ken

It would be ok if you provided the following link: ftp://ftp.dot.state.az.us
Then a logon box would come up and all they need to do is enter the appropriate credentials (roadway/heat).

Arizona Department of Transportation

STATE ENGINEER'S OFFICE

MEMORANDUM

To: ITD Employees	**Date:** June 23, 2005
From: Sam Maroufkhani, Acting State Engineer	**Subject:** CADD Electronic Files Archiving Process

Effective July 1, 2005, all ADOT Project Managers will implement the ADOT CADD Files Archiving Process.

The attached document titled "Computer-Aided Design and Drafting (CADD) Standards For All Project Related Deliverables" outlines what files are to be provided and how the files are to be submitted for archiving for each Design Technical Unit. At this time the ADOT Archiving Team is focusing upon the method for archiving the "As-Bid" electronic files. After this process is implemented, the Team will focus on the "As-Built" process. The CADD Archiving Process will be the standard method for both ADOT staff-designed projects as well as consultant-designed projects.

The primary Project Manager is central to a project. The Project Manager role is crucial to ensuring that all Design Technical Units' Project data is archived at the same time. (See attached ADOT CADD Files Archiving Process Flow Chart.)

A new ITD policy regarding the ADOT CADD Files Archiving Process is in process. Upon completion of the policy, you will be advised when the policy is available on the intranet website.

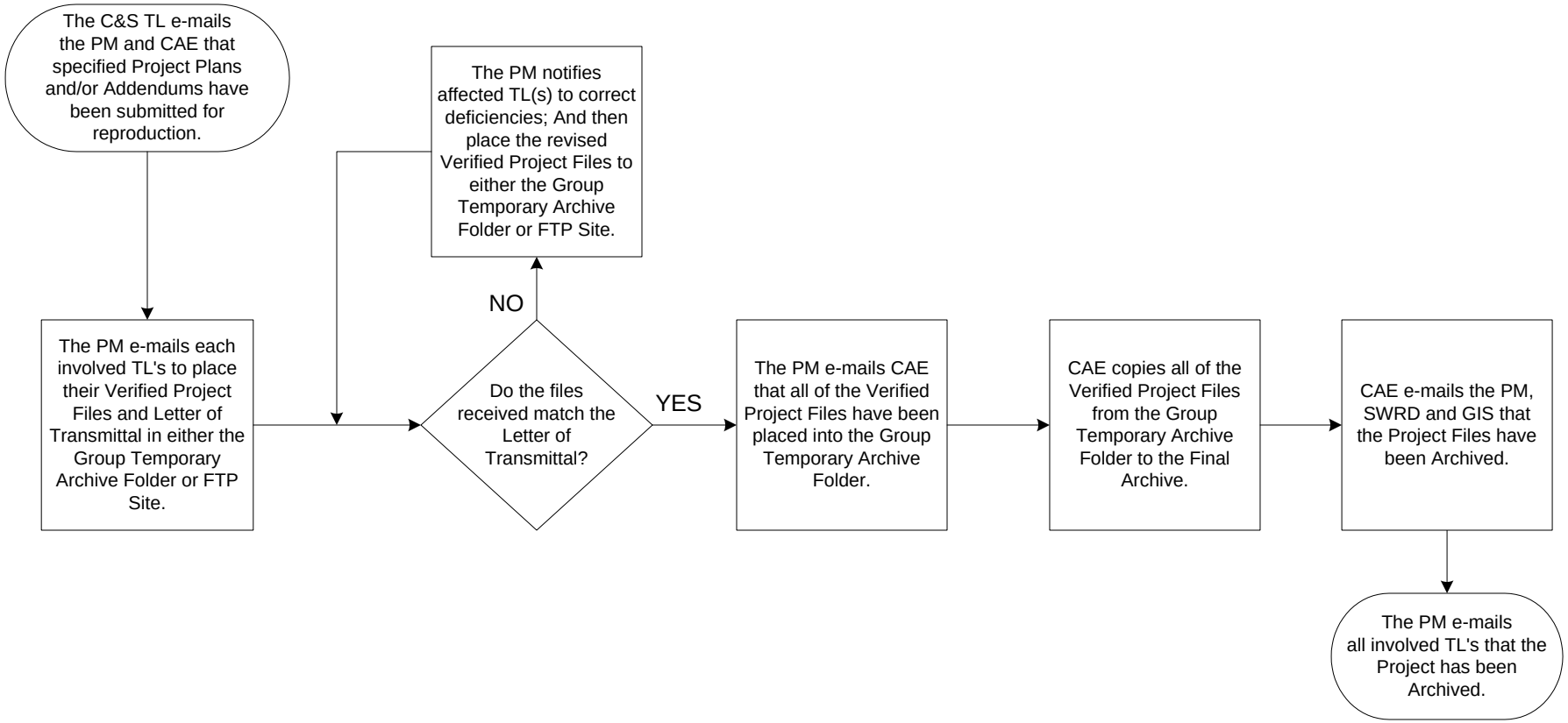
Your cooperation is appreciated to implement this process that will assure ADOT has ready access to all Electronic CADD files they have commissioned.

ADOT CADD Files Archiving Process*

Task Level Map

DEFINITIONS:
ADOT Standards - ADOT Design Software (MicroStation, et al) Resource files, Design Criteria and Drafting Guidelines.
C&S - Contracts & Specification Services.
CAE - The Computer Aided Engineering Archive Liaison.
Final Archive - The Final Archive Folder is on \\e980ts04\Archive.
FTP Site** - File Transfer Protocol (FTP). An Electronic site for Design Consultants to use to transfer Electronic Files through ADOT's firewall.
PM - The ADOT Project Manager responsible for all project related activities.
SWRD - Statewide Record Drawings Liaison.
Temporary Archive Folder ** - An Electronic site for ADOT Design Groups Electronic Files (\\e980ts04\MSV7).
TL - The Technical Leader of individual Design Units (ADOT or Consultant), responsible to assure that all CADD Files have been completed in ADOT Standard File Format.
Verified - The PM confirms with the TL that all related files & file-formats have been received, and meet ADOT Standard file formats. It will not be necessary for the PM to check the information confirmed within the files.

** If these Electronic Folders are not used, the Design Units (ADOT or Consultant) have the option to submit two (2) copies of their Electronic Files on Compact Discs to be delivered to the PM.



* Archive Process Excludes Materials Group and Engineering Surveys

Computer-Aided Design and Drafting (CADD) Standards for all Project related Deliverables.

ADOT shall retain all rights and ownership of all Electronic Files and Hardcopy Deliverables throughout the Design Phases.

General Specifications:

All drawings to be archived shall conform to ADOT drafting and CADD standards, including CADD file naming convention. The current ADOT approved version of Bentley's MicroStation software will be used. All graphic files shall be provided in MicroStation native design file format (.dgn), and contain data in vector format only. Digital Terrain Model (.dtm) files shall be produced with Bentley's InRoads/Site/Survey Select Cad compatible file formats. Raster data shall not be accepted unless otherwise stated by ADOT. Use of non-MicroStation vector format and subsequent translation of graphic files to the .dgn format shall not be acceptable. No zipped files shall be accepted. Reference files are not to be copied into the plan sheets master file. All electronic "design sheets" will be delivered in a typical "Plan View" (dependant upon sheet contents) in view 1. ADOT cells are not to be modified unless approved by ADOT.

All final Consultant project Electronic CADD data files may be delivered through a File Transfer Protocol (FTP) Site. Alternatively, two (2) copies of the electronic files shall be submitted on CD-Rom (multiple CD's shall be allowed). All final project documentation, electronic files (.dgn, ASCII, .alg, .dtm, project wide reference files, etc.) and hard copy, shall be packaged separately, suitably labeled and delivered to the assigned ADOT primary Project Manager, and/or to the Technical Leader as identified below.

All deliverables shall contain an electronic Index of files and a letter of transmittal to the designated areas and all CD's must be labeled with the information stated below:

- **Identification Label For CD and Case:**
  Prepared By:
  Federal Project Number:
  Route:
  Milepost (Beginning/Ending):
  Prefix (Rt, Co, MP) and TRACS Number:
  Project Name:
  Type of Files:
  Creation Date:
  Disc (#) of (total #)

In addition to the requirements stated above in the General Specifications, all designers of ADOT projects shall provide the following information requested by the individual areas. If unclear about items needed for your project, please contact the Project Manger.

Bridge:

Identification Label

1. Structure Number (4 digit number)
2. Structure Name (Wildcat Wash Bridge)
3. Type of work category:
    a) Major Structure – New Bridge
    b) Bridge Replacement
    c) Minor Structure
    d) Deck Rehabilitation
    e) Hinge, Deck or Joint Repair
    f) Barrier Replacement
    g) Bridge Widening
    h) Scour Protection
    i) Seismic Retrofit

Materials:

(Geotech)

In addition to the CADD requirements stated in the General Specifications, all Consultants of ADOT Geotech projects shall provide the following information to the Project Engineer for ADOT Geotech Section:

1. One (1) Electronic Copy of the final Geotech Design sheets submitted on CD-Rom.
2. One (1) half-size (11”x17”) print of the Geotech sealed and signed final design sheets.

Roadway Engineering:

See General Specifications.

Right of Way:

All R/W plans are to conform to current R/W Plans Standards and Manual.
Final Task Submittal FINAL R/W PLANS
When all comments have been addressed, the designers of ADOT projects shall submit the following:

1. Beginning and Ending Mileposts in tenths of a mile
2. Revised Calculation Book sheets and Point ID sheets, if necessary.
3. An ASCII coordinate electronic file in the following format: Point Number, Northing, Easting, and Description using commas as delimiters. The designers of ADOT projects shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file shall be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. Only numeric numbers shall be accepted.
4. One (1) half-size print of the Final Right of Way Plans set.
5. Full-size set of Sealed and Signed Mylar's trimmed to 22" x 34"

Traffic Engineering:

Upon Final Design Approval for any and all work that involves Traffic Engineering/Design, the Traffic Engineering Group requires that the following CADD related deliverables be submitted to the Primary Project Manager as indicated in the General Specifications. In addition, a copy of the Letter of Transmittal indicating all Traffic related deliverables have been submitted to ADOT shall be forwarded to the Traffic Engineering Project Manager for approval.

1. All SignCad files shall be submitted in ADOT's current version of SignCad (.SGN).
2. All Design CADD files associated with Traffic Design, including Traffic Signals, Signing, Pavement Marking, Traffic Control, Pre-Design, HES Projects, and Permit Designs, shall be submitted in ADOT's current version of MicroStation 2D format (.DGN)(2D).

Engineering Surveys:

(Location Surveys and Photogrammetry)

In addition to the CADD requirements stated in the General Specifications, all designers of ADOT projects shall provide the following information to the Engineering Survey Section:

1. Ground Adjustment Factor (G.A.F.):
2. Contour Interval (C.I.):
3. Project Scale:
4. Horizontal and Vertical Datums:
5. Arizona Zone:
6. Hard copy of reports including any plots

Based on the Scope of Work, select the items to be delivered:

1. Hard Copies shall consist of the following:
    a) Field notes
    b) Sketches
    c) Transit and Level books
    d) Plots
    e) Reports

2. (.dgn) file containing graphical representation of the project (i.e. Planimetrics and contours).

3. (.3d) file containing graphical representation (i.e. breaklines and random points) to produce the DTM.

4. (.dtm) containing Engineering Surveys approved features that make up a correct surface representation.

5. (.alg) file containing the project alignments. (.rpt) file including curve data from the alignment.

6. ASCII (.csv) files shall contain the following:
    a) File Header Information:
        i. Project GAF
        ii. Project Datums
        iii. Arizona Zone
        iv. Basis of Alignment
        v. Basis of Stationing
        vi. Basis of Horizontal Control
        vii. Basis of Elevation
        viii. Basis of Bearing
    a) All Project Control
    b) Section Corners
    c) R/W Monumentation
    d) Structures
    e) Edge of pavement
    f) Centerline and driving stripes
    g) Other features as requested

Note: Two (.csv) files shall be submitted, one containing the RAW survey data and another containing the Edited survey data.

1. All Film Negatives used to map a project
2. Scanned Images and/or Diapositives used to map project
3. Aerotriangulation files used to control photography
4. Orthophotos produced for the mapping project
5. Record of Survey: When requested, Record of Survey shall be in electronic (.dgn / .pdf) format with a stamped original.
6. Pictures: Upon Request pictures shall be taken for all structures including end of pipes, and headwalls, caps, and any un-natural terrain feature in a (.jpg or .bmp) file format (check scope of work).

If unclear about items needed for your project, please contact the Engineering Survey Section.

ADOT PROJECT MANAGER:

All survey and photogrammetry projects shall be submitted to the Engineering Survey Section through the ADOT and Consultant Project Manager, for verification of deliverables and archiving purposes. A notification of findings shall be sent to the Project Manager after completion of project review.

IPLOT QUE DESCRIPTIONS

Updated June 28, 2002

aerials

PEN TABLE: aerials.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” paper plotter, 90 degree rotation
NOTES: (Paper) raster image full size plan sheet

drainage

PEN TABLE: drainage.pen
SUBDUE: If level=1-37, 40-47, 49-61 AND color is not=100-153, 155-163
OR Subdue levels 38,39, and 48 if color=100-153, 155-163
ATTRIBUTE: 34” paper plotter, 90 degree rotation
NOTES: (Paper) full size plan sheet, check or final plot (Roadway Design)

final

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” vellum plotter, 90 degree rotation
NOTES: (Vellum) full size plan sheet, final plot

final34

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 34” vellum plotter, 90 degree rotation
NOTES: (Vellum) full size plan sheet, final plot

finals

PEN TABLE: subdue.pen
SUBDUE: Only if level=1-24, 29, 31, 60 AND color is not 100-153, 155-164
ATTRIBUTE: 34” vellum plotter, 90 degree rotation
NOTES: (Vellum) full size plan sheet, final plot

full

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” paper plotter, 90 degree rotation
NOTES: (Paper) full size plan sheet, check or final plot

fulls

PEN TABLE: subdue.pen
SUBDUE: Only if level=1-24, 29, 31, 60 AND color is not 100-153, 155-164
ATTRIBUTE: 36” paper plotter, 90 degree rotation
NOTES: (Paper) full size plan sheet, check or final plot

haerials

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” paper plotter, ½ wt, 90 degree rotation
NOTES: (Paper) raster image half size plan sheet, check plot

half

PEN TABLE: half.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” paper plotter, ½ wt, 90 degree rotation
NOTES: (Paper) half size plan sheet, check plot

halfs

PEN TABLE: halfs.pen
SUBDUE: Only if level=1-24, 29, 31, 60 AND color is not=100-153, 155-163
ATTRIBUTE: 36” paper plotter, ½ wt, 90 degree rotation
NOTES: (Paper) half size plan sheet, check plot

paper36

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” paper plotter, 0 degree rotation
NOTES: (Paper) map, check plot

special

PEN TABLE: special.pen
SUBDUE: Only if level=2-11, 13, 15-17, 22-23 AND color is not 100-153,155-163
ATTRIBUTE: 36” paper plotter, 90 degree rotation
NOTES: (Paper) full size plan sheet, check plot

specialh

PEN TABLE: specialh.pen
SUBDUE: Only if level=2-11, 13, 15-17, 22-23 AND color is not 100-153,155-163
ATTRIBUTE: 36” paper plotter, ½ wt, 90 degree rotation
NOTES: (Paper) half size plan sheet, check plot

truhalf

PEN TABLE: half.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” paper plotter, ½ wt, 90 degree rotation
NOTES: (Paper) half size plan sheet, check plot

utility

PEN TABLE: utility.pen
SUBDUE: Only if level=1-10, 13-39, 42-61 AND color is not 100-153, 155-163
ATTRIBUTE: 36” paper plotter, 90 degree rotation
NOTES: (Paper) full size plan sheet, check or final plot (Roadway Design)

vellum36

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” vellum plotter, 0 degree rotation
NOTES: (Vellum) map, final plot

Vel_aerials

PEN TABLE: normal.pen
SUBDUE: Any level if color=100-153, 155-163
ATTRIBUTE: 36” vellum plotter, 0 degree rotation
NOTES: (Vellum) raster image map, final plot